

L 13052-63

EWI(1)/EWG(k)/BDS/EEC(b)-2 AFFTC/ASD/ESD-3 Pz-4

AT/IJP(C)

ACCESSION NR: AT3002999

S/2927/62/000/000/0152/0176

67  
65

AUTHOR: Kapitonov, A. I.; Tuchkevich, V. M.; Chelnokov, V. Ye.

TITLE: Investigation of the current-voltage characteristics of diffusion electron-hole junctions in silicon [Report the All-Union Conference on Semiconductor Devices, held in Tashkent from 2 to 7 October 1961]

SOURCE: Elektronno-dy\*rochny\*ye of perekhody\* v poluprovodnikakh. Tashkent, Izd-vo AN UzSSR, 1962, 152-176

TOPIC TAGS: semiconductor, silicon p-n junction, diffusion silicon p-n junction

ABSTRACT: An extensive experimental investigation and comparisons of its results with existing theories are reported in the article. Current-voltage characteristics of silicon "sun batteries" studied by the authors in 1957 did not agree with the Shockley's "classical theory" (Bell Syst. Techn. J., 28, July, 1949); nor did it agree with the improved theory by C. T. Sah, R. Noyce, and W. Shockley (Proc. IRE, 9, 1957). A new method for manufacturing power silicon rectifiers by diffusing B into n-type Si was developed. The diffusion was conducted in air at high temperature. Resulting diodes with a 3.14-sq-cm p-n junction area passed about 1,000 amp of average rectified current (water cooling) and had a breakdown voltage

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ACCESSION NR: AT3002999

of 2,000 v. In 1962, power h-v diffusion Si rectifiers for 200 amp (air-cooled) and 350 amp (water-cooled), at 700 v were set in lot production. The following experiments are described in the article. Effects of applied reverse voltage on the capacitance and the width of space-charge region were determined. The reverse branch of the current-voltage characteristic was studied and interpreted in terms of space-charge-generated and recombination currents; also effects of junction environment (coating, etching, dry air, aging, kerosine, oil) on the current-voltage characteristic were investigated. The forward branch of the current-voltage characteristic was studied in detail: at low and medium voltages and at high injection levels; also effects of temperature were investigated. As the current-voltage relations in a Si p-n junction could not be fully explained by any existing theory, further experiments involved testing a diode, remodeling it into a photocell, testing the latter, remodeling it back into diode, and testing again. The "anomalous behavior" of the current-voltage characteristic is explained by the properties of its working surface. Finally, breakdown conditions of Si diodes were studied: effect of source Si resistivity on the breakdown voltage, effect of temperature on the current and voltage at which the current-voltage characteristic collapses, and effect of temperature on the reverse branch of the current-voltage characteristic. It was found that the thermal breakdown which usually occurs in Si p-n junctions is due to a "weak spot" on the surface of the

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ACCESSION NR: AT3002999

2

junction; photographs and an oscillogram of the breakdown are submitted.  
"Investigation of capacitance of the diffusion p-n junctions in question were  
carried out by A. A. Lebedev in our laboratory." Orig. art. has: 21 figures,  
59 formulas, and 2 tables.

ASSOCIATION: Akademiya nauk SSSR (Academy of Sciences SSSR) Akademiya nauk  
Uzbekskoy SSR (Academy of Sciences SSSR) Tashkentskiy gosudarstvennyy  
universitet (Tashkent State University)

SUBMITTED: 00

DATE ACQ: 15May63

ENCL: 00

SUB CODE: 00

NO REF SOV: 006

OTHER: 006

Card 3/3

L 13061-63

BDS/EWT(1)/EWP(q)/EWT(m)/EEC(b)-2 AFFTC/ASD/ESD-3  
AT/JD/IJP(C)

ACCESSION NR: AT3003007

S/2927/62/000/000/0220/0224

AUTHOR: Lebedev, A. A.; Tuchkevich, V. M.

TITLE: Investigation of p-n junction capacitance as function of temperature and frequency [Report of the All-Union Conference on Semiconductor Devices held in Tashkent from 2 to 7 October 1961]

SOURCE: Elektronno-dy\*rochny\*ye perekhody\* v poluprovodnikakh. Tashkent, Izd-vo AN UzSSR, 1962, 220-224

TOPIC TAGS: germanium diode capacitance, silicon diode capacitance

ABSTRACT: Some theoretical works dealing with the junction capacitance are reviewed, and a source formula for admittance of a p-n junction is selected. Authors' experiments are described with the following semiconductor devices: (1) n-Ge diodes with a resistivity of 50-60 ohm/cm; the alloy junction area is 5-7 sq mm; (2) same, but the resistivity is 30-40 ohm/cm and the area is 3 sq cm; (3) diffusion-type Si rectifiers with a p-n junction area of 3 sq cm; source Si had n-type conductance and a resistivity of 30-40 ohm/cm. The capacitances were measured by a bridge method at 20-700 kc. Capacitance vs.

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ACCESSION NR: AT3003007

frequency curves for various applied voltages are presented, as well as a number of auxiliary curves serving to compute the capacitance. It is inferred that the p-n junction capacitance of Ge and Si (alloy or diffusion) devices depend on both the temperature and the frequency. The capacitance is reliably described by the Tolpy\*go and Rashba formula (ZhTF., 25, 1335, 1955). Orig. art. has: 6 figures and 5 formulas. 3

ASSOCIATION: Akademiya nauk SSSR (Academy of Sciences SSSR); Akademiya nauk Uzbekskoy SSR (Academy of Sciences UzSSR); Tashkentskiy gosudarstvennyy universitet (Tashkent State University)

SUBMITTED: 00

DATE ACQ: 15May63

ENCL: 00

SUB CODE: 00

NO REF SOV: 005

OTHER: 003

Card 2/2

L 12827-63

EW(1)/EWG(k)/EWP(q)/EW(m)/BDS/T-2/EEC(b)-2/ES(t)-2

AFFTC/ASD/ESD-3 Pz-4/Pm-4 JD/IJP(C)

ACCESSION NR: AT3003023

S/2927/62/000/000/0295/0300

AUTHOR: Tuchkevich, V. M.; Uvarov, A. I.; Yakovchuk, N. S. 77

TITLE: Fluctuations of the reverse conductance in germanium and silicon rectifiers  
[Report at the All-Union Conference on Semiconductor Devices, Tashkent, 2-7 Oct., 1961] 27 27

SOURCE: Elektronno-dy\*rochny\*ye perekhody\* v poluprovodnikakh. Tashkent, Izd-vo AN UzSSR, 1962, 295-300

TOPIC TAGS: germanium rectifier; silicon rectifier

ABSTRACT: Continuous operation of high-power germanium rectifiers (including the industrial water-cooled VG-500, 500 amp, 100 v type) was investigated. Due to visible surface short-circuits, the Soviet rectifiers broke down at any time, from a few minutes to a few months of continuous operation. It was found that a continuously applied reverse voltage of 100 v dc causes failure while a short-time 200 v is safe. Further studies revealed that the breakdown was connected with fluctuations of the reverse conductivity, and the latter was due to the presence of moisture on the rectifier surface. Fluctuations were accurately measured, and 25

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ACCESSION NR: AT3003023

the corresponding curves are presented in the article. The following recommendations are offered: (1) each branch of the rectifying circuit should include at least two Ge rectifiers in series; (2) a high-resistance voltage divider should be used. The authors consider their work as preliminary. Orig. art. has: 4 figures and 2 formulas.

ASSOCIATION: None

SUBMITTED: 00

DATE ACQ: 15May63

ENCL: 00

SUB CODE: PH, GE

NO REF SOV: 000

OTHER: 000

Card 2/2

hh273

S/105/62/000/012/002/003

E194/E155

9.2150

AUTHORS: Alferov, Zh.I., Tuckevich, V.M., and Trukan, M.K.

TITLE: The p-n junction temperature in germanium power rectifiers during the forward half-cycle

PERIODICAL: Elektrichestvo, no.12, 1962, 64-66

TEXT: The temperature of the p-n junction in semiconductor rectifiers may determine their failure on overload. The temperature function of the forward voltage drop is a better criterion than that of the reverse saturation current because the latter cools the p-n junction. A family of V-A characteristics is determined at different temperatures by applying current impulses to the rectifier. If the pulse characteristics are correctly chosen there is no heating of the p-i-n structure by the passage of current and no phase displacement between current and voltage due to rectifier diffusion capacitance. The thyatron pulse-generator circuit that was used delivered a sinusoidal voltage wave with an overall duration of 300 microseconds and with flattened peak lasting about 20 microseconds. Peak currents of up to 1000 A were delivered with a pulse-recurrence frequency of

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S/170/62/005/008/004/009  
B104/B102

AUTHORS: Zabelina, L. G., Nikitina, G. V., Romanenko, V. N.,  
Tuchkevich, V. M.

TITLE: Effect of heat abduction through the end of an ingot on zone  
melting

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, v. 5, no. 8, 1962, 81-83

TEXT: The zone levelling of the impurity concentration distribution in Ge is studied. The germanium samples were purified by zone melting and then alloyed with various impurities. The composition was checked by measuring the resistivity and the Hall-emf. After some cycles of zone levelling the impurity distribution was measured (Fig. 1), which showed that the position of the zone strongly influences the impurity concentration. This is related to the heat balance in zone levelling. To ensure regular conditions the adoption of annular ingots is recommended. There is 1 figure. ✓

Card 1/2

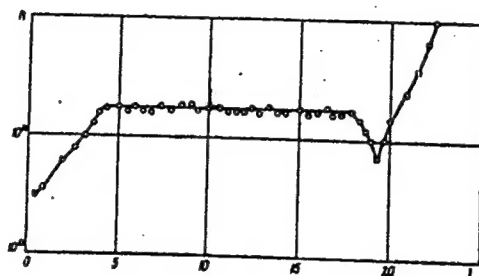
Effect of heat abduction through the end...B104/B102

S/170/62/005/008/004/009

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR imeni A. F. Ioffe, g. Leningrad (Physicotechnical Institute AS USSR imeni A. F. Ioffe, Leningrad)

SUBMITTED: December 2, 1961

Fig. 1. Impurity distribution  $n$  ( $\text{cm}^{-3}$ ) over the length  $l$  (cm) of a crystal.



Card 2/2

Negative magnetoresistivity in hexagonal, n-type silicon carbide.  
V. Mirzabayev, V. M. Tuchkevich, Yu. V. Shmartsev (10 minutes).

Structure and electrical properties of the system CdSe-HgSe.  
M. V. Kot, V. A. Mshenskiy.

Structure and electrical properties of the system HgTe-ZnTe.  
S. A. Danilyuk, M. V. Kot.

Structure and electrical properties of the system ZnSe-HgSe.  
M. V. Kot, A. V. Simashkevich.

Report presented at the 3rd National Conference on Semiconductor Compounds,  
Kishinev, 16-21 Sept 1963

L 16042-63  
ACCESSION

42-63  
SESSION NR:  
AUTHORS:  
SOURCE:  
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AUTHORS:  
SOURCE:  
TITLE:

63  
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THORS:  
SOURCE:  
TITLE:

NR: AP30012  
 TS: Mirzabay  
 CE: Fizika  
 LE: Negative  
 TOPIC TAGS:  
 Impurity

APPROVED FOR RELEASE: 08/31/2001

**CIA-RDP86**

Card 1/2

L 18042-63

ACCESSION NR: AP3001282

different mobilities. For samples with higher concentration of impurities, decrease in resistivity is probably associated with change in effectiveness of scattering in the magnetic field. If the scattering occurs at unordered spin moments of impurity centers, then (in a magnetic field) the orientation of spins should be ordered, and the effectiveness of scattering should decline. "In conclusion, the authors express their thanks to V. S. Vyazovkin and I. A. Chayka for aid in the work." Orig. art. has: 7 figures and 1 table.

ASSOCIATION: Fiziko-tehnicheskii institut im. A. F. Ioffe AN SSSR, Leningrad (Physical and Technical Institute, Academy of Sciences, SSSR)

SUBMITTED: 21Jan63

SUB CODE: PH

DATE ACQ: 01Jul63

NO REF SOV: 003

ENCL: 00

OTHER: 012

Card 2/2

TUCHKEVICH, Vladimir Maksimovich

[Semiconductor power rectifiers] Moshchnye poluprovodni-  
kovye vypriamiteli. Leningrad, Leningradskii dom nauchno-  
tekhnicheskoi propagandy, 1964. 31 p. (Poluprovodniki,  
no.7) (MIRA 17:9)

TOPIC 1A43: semiconductor converter, semiconductor gate, inverter / WXD 200  
silicon rectifier, TETRA

L 12429-65

ACCESSION NR: AP4046584

evaluated at all stages of its development. An AC voltage applied to the control electrode produced DC rectification from half to full power, while a pulse applied



"APPROVED FOR RELEASE: 08/31/2001

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APPROVED FOR RELEASE: 08/31/2001

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L 12429.65

Cord u/c

L 12429-65

ACCESSION NR: AP4040584

ENCLOSURE: 02

1 - CONTROLLER, GALE, 1968,  
C - CONTROLLER,

A 1 1



the volt-ampere characteristics of the junctions at 77, 295, and 307°K

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1. ZSS10K 4K

1. ZSS10K 4K

150

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1. ZSS10K 4K

1. ZSS10K 4K

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

SOURCE: *Plasma i verdogo tela*, v. 6, no. 9, 1964, 2673-2682

TOPIC TAGS: silicon carbide, n type silicon carbide, galvanomagnetic property, electrical properties, semiconductor, silicon carbide, n type

ABSTRACT: Electrical properties of n type silicon carbide, for the first time, have been investigated. The results show that the material has a high resistance with a free carrier concentration of  $10^{18}$  cm<sup>-3</sup>. Green

"APPROVED FOR RELEASE: 08/31/2001

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ACCESSION NR: AP40449 JR

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"



L 16337-65 EWT(1)/EFA(s)-2/EWT(m)/EWT(1)/EWT(1)  
ESD(ss)/SSD/AFW

ACCESSION NR: AP5000682

S/0181/64/006/012/3718/3721

AUTHORS: Mirzabayev, M.; Tuchkevich, V. M.; Shmartsev, Yu. V.

TITLE: Piezo- and magnetoresistance in n-type germanium

SOURCE: Fizika tverdogo tela, v. 6, no. 12, 1964, 3718-3721

TOPIC TAGS: germanium, magnetoresistance, piezoresistance, spin, impurity center

ABSTRACT: The authors measured the piezoresistance of dislocation-free samples of n-type germanium doped with antimony, with carrier densities from  $2 \times 10^{17}$  to  $2 \times 10^{18}$  cm<sup>-3</sup>. The piezoresistance of the samples was measured at four different dislocation densities. An attempt is made to explain the observed results. Both the piezoresistance and the magnetoresistance of the samples at low tensile and compressive stresses, pass through a minimum, and

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"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7

SECRET

ACCESSION NR: APAC, 641

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

L 16337-65

ACCESSION NR: AP5000682

ASSOCIATION: Fiziko-tekhnicheskii institut im. A. F. Ioffe AN  
SSSR (Physicotechnical Institute AN SSSR)

SUBMITTED: 07Jul64

ENCL: 00

SUB CODE: SS,EM

NR REF SOV: 002

OTHER: 006

Card 3/3

**ABSTRACT:** The negative magnetoresistance at low temperature previously observed in various semiconductor materials has been investigated in the

... the data on resistivity,  $\rho$ , Hall constant, carrier concentration, and electron mobility

ALL INFORMATION CONTAINED

temperature dependence of  $k_1$  and the half constant was shown to be  
exponential for all samples. The results are graphically summarized.

L 11893-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/GG

ACC NR: AT6002249

SOURCE CODE: UR/2564/65/006/000/0193/0198

AUTHOR: <sup>44 55</sup> Golubev, L.V.; <sup>44 55</sup> Tuchkevich, V.M.; <sup>44 55</sup> Shmartsev, Yu. V.

ORG: none

TITLE: Growing of heavily doped dislocation-free germanium single crystals

SOURCE: AN SSSR. Institut kristallografi. Rost kristallov, v. 6, 1965, 193-198

TOPIC TAGS: single crystal growing, germanium single crystal, antimony, gallium, crystal dislocation

ABSTRACT: After discussing the effect of the conditions of growing single crystals by Czochralski's method on the dislocation density, the authors discuss the technique which they used to grow germanium single crystals doped with Sb or Ga and relatively free of dislocations. Two types of apparatus were employed: one for growing small-diameter crystals in a hydrogen atmosphere, and another for growing crystals up to 30 mm in diameter in a vacuum. The dislocation density was measured with an MBI-6 microscope after alkaline etching of polished sections. Fifteen germanium single crystals containing impurities in concentrations from  $10^{17}$  to  $10^{19}$  cm<sup>-3</sup> for Sb and from  $10^{17}$  to

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L 11893-66

ACC NR: AT6002249

$6 \times 10^{19} \text{ cm}^{-3}$  for Ga were grown. The dependence of dislocation mobility on the concentration of Sb in Ge was studied at 290 and 4.2K. The mobilities observed at 4.2K, up to  $1100 \text{ cm}^2/\text{V sec}$  in samples with impurity concentrations in excess of  $10^{18} \text{ cm}^{-3}$ , were the highest of all obtained thus far. Orig. art. has: 5 figures and 2 formulas.

SUB CODE: 20, // SUBM DATE: none / ORIG REF: 013 / OTH REF: 017

OC  
Card 2/2

L 11597-66 EAT(l)/EAT(r)/T/SMF(t)/ETI IOP(c) JD

ACC NR: AP6018550

SOURCE CODE: UR/0181/66/008/006/1851/1858

AUTHOR: Polyanskaya, T. A.; Sikharulidze, G. A.; Tuchkevich, V. M.; Shmartsev, Yu. V.

ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-  
tekhnicheskiy institut AN SSSR)

85

TITLE: Galvanomagnetic phenomena in  $\text{CdSnAs}_2$

84

B

SOURCE: Fizika tverdogo tela, v. 8, no. 6, 1966, 1851-1858

TOPIC TAGS: cadmium compound, galvanomagnetic effect, magnetoresistance, energy band structure, conduction band, electron interaction, phonon interaction

ABSTRACT: The purpose of the work was to investigate galvanomagnetic phenomena in both n- and p-type samples in a broader temperature interval than in the past, so as to obtain information on certain parameters of the band structure and on the carrier scattering mechanisms in  $\text{CdSnAs}_2$ . The measurements were made on two n-type and two p-type single-crystal samples in the temperature interval from 1.3 to 450K, by a dc potentiometric method, using a system of glass cryostats in a magnetic field up to 12 kG. Analysis of the results shows that the experimental data do not contradict the theoretical ideas concerning the structure of the conduction band. It is assumed that the predominant scattering mechanism at  $T > 300\text{K}$  is interaction between electrons and optical phonons. The effective mass of the holes is found to be  $m_h^* \approx 0.1m_0$ , and the mobility ratio  $b = \mu_n/\mu_p = 25$  (at  $T \approx 300\text{K}$ ). It is proposed that at low temperatures, appreciable contribution to the electric conductivity of p-type samples is

Card . 1/2



L 41597-66

ACC NR: AP6018550

made by fast holes. This assumption agrees with the experimentally observed complicated dependence of the magnetoresistance on the magnetic field induction. The authors thank A. Ya. Vul for great help with the measurements. Orig. art. has: 7 figures and 1 table.

SUB CODE: 20/ SUBM DATE: 22Nov65/ ORIG REF: 006/ OTH REF: 010

*ms*  
Card 2/2

L 38192-66 EWT(1)/EWT(m)/T/EWP(t)/ETI IJP(c) JD/JG  
ACC NR: AP6023613 SOURCE CODE: UR/0105/66/000/007/0056/0059

AUTHOR: Volle, V. M.; Grekhov, I. V.; Kryukova, N. N.; Tuchkevich, V. M.;  
Chelnokov, V. Ye.; Shuman, V. B.; Yakivchik, N. I.

ORG: Leningrad Physicotechnical Institute im. Ioffe, AN SSSR (Leningradskiy fiziko-  
tekhnicheskii institut. AN SSSR)

TITLE: VKDL-type diffused silicon avalanche power rectifiers

SOURCE: Elektrichestvo, no. 7, 1966, 56-59

TOPIC TAGS: semiconductor rectifier, silicon controlled rectifier

ABSTRACT: The development is reported of new types of diffused silicon power rectifiers. The rectifiers, which can be operated safely under high peak inverse voltages, differ from conventional diffused silicon rectifiers in that, due to special preparation of the p-n junction, the possibility of local electric breakdown at the intersection of the p-n junction with the surface is eliminated. Therefore, under peak inverse voltages, the process of avalanche breakdown takes place in the central section of the junction, while large power is dissipated in the inverse direction. In 1964, the Leningrad Physicotechnical Institute im. Ioffe, AS USSR, in cooperation with the "Elektrovypryamitel" Plant developed a series of such rectifiers bearing the designations VKDL-100, VKDL-200 and VKDL-350 for 100, 200, and 350 amp, respectively, and an 800-v operating voltage. The rectifying element of these devices is in the

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UDC: 621.382.3

ACC HR AP6923613

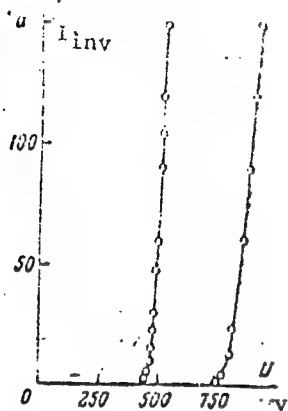


Fig. 1. Voltage-inverse current characteristic of the VKDL rectifiers

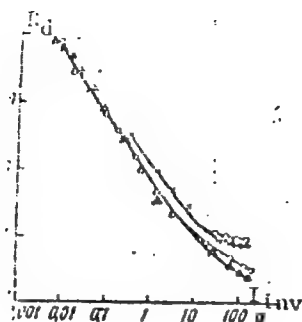


Fig. 2. Dependence of the dynamic resistance of the VKDL rectifiers on the inverse current

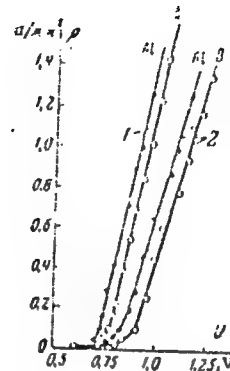


Fig. 3. Voltage-forward current characteristic of p-n junctions

form. of a 25-mm silicon plate with a p-n-n<sup>+</sup> type conductivity. Two thermally compensating tungsten disks are pressed against the plate. A method of planar guard ring construction, described elsewhere (Haitz, R. M., A. Goetzberger, R. M. Scarlett,

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ACT NR: AP6023613

ant W. J. Shockley, J. Appl. Phys., v. 34, 1963), was used to eliminate the possibility of surface breakdown. The p-n junctions were made by the method of phosphorus boron and aluminum diffusion. The boron p-n junction was 18 mm in diameter with a planar guard ring 2 mm wide. The thickness in the diffused layer in the central section of the silicon plate was 60—80  $\mu$ , and in the region of the guard ring, 120—160  $\mu$ . The thickness of the diffused layer formed by phosphorus on the side of the base contact was 20  $\mu$ . Typical voltage-inverse current characteristics of the rectifiers in the breakdown region at 500 and 800 v are shown in Fig. 1. The characteristics correspond to the central p-n junction. The breakdown voltage of the p-n junction in the guard ring exceeds that of the central p-n junction by 250—600 v depending on the initial silicon resistance. Dependence of the dynamic resistance of avalanche rectifiers on inverse current is shown in Fig. 2, and the voltage-forward current characteristic in Fig. 3. With respect to the forward voltage drop, the above devices are divided into three groups: those with a 0.4—0.5, 0.5—0.6, and 0.6—0.7 v forward voltage drop for a nominal current. The inverse current under nominal conditions for all rectifiers does not exceed 5 ma. The lifetime of the avalanche rectifiers is up to 25,000 hr. The number of thermal cycles ranging from -50 to +100C should not exceed 5000 during the entire lifetime. The rectifiers can be connected either in series or in parallel. When connected in parallel, they should have equal forward voltage drops. Orig. art. has: 1 table and 8 figures. [JR]

SUB CODE: 09/ SUBM DATE: 10May65/ ORIG REF: 003/ OTH REF: 001/ ATD PRESS:

Card 3/3

ACC NR: AP7001892

SOURCE CODE: UR/0020/66/171/004/0830/0832

AUTHOR: Borshchevskiy, A. S.; Goryunova, N. A.; Sikharulidze, G. A.; Tuchkevich, V. M.; Shmartsev, Yu. V.

ORG: Physicomathematical Institute im. A. F. Ioffe, Akademii nauk SSSR (Fiziko-matematicheskii institut im. A. F. Ioffe, Akademii nauk SSSR)

TITLE: Preparation and some properties of  $\text{CdSnAs}_2$  semiconductor compound

SOURCE: AN SSSR. Doklady, v. 171, no. 4, 1966, 830-832

TOPIC TAGS: cadmium tin arsenide, arsenide single crystal, single crystal growing, single crystal property, zone refining

ABSTRACT: A method for growing crack-free  $\text{CdSnAs}_2$  single crystals is described. The synthesis was carried out in a quartz ampoule and pure-argon atmosphere at a stoichiometric proportion of components and a temperature of 750C. The obtained compound was then zone refined. Crystals up to 7 cm long and about 1 cm in diameter were grown from the zone-refined ingot by zone melting at 585—589C with a molten zone speed of 0.8 cm/hr. The respective properties of the specimens cut from the middle and end portions of the single crystal were: Hall constant 80 and  $3.7 \text{ cm}^3/\text{coulomb}$ .

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UDC: 537.311.33

ACC NR: AP7001892

resistivity  $5 \cdot 10^{-3}$  and  $4.9 \cdot 10^{-4}$  ohm·cm, electron concentration  $7.8 \cdot 10^{16}$  and  $1.7 \cdot 10^{18}/\text{cm}^3$ , and mobility 16,000 and 7,650  $\text{cm}^2/\text{v} \cdot \text{sec}$ . Orig. art. has: 1 figure and 1 table.

SUB CODE: 20/ SUBM DATE: 20Dec65/ ORIG REF: 003/ OTH REF: 006/ ATD PRESS: 5111

Card -2/2

L 30991-66 EWP(e)/EWT(m)/T/EWP(t)/EWT(k)/EWP(z)/EWP(b) IJP(c) JD  
ACC NR: AP6002888

SOURCE CODE: UR/0286/65/000/024/0045/0045

INVENTOR: Grekhov, I. V.; Linnychuk, I. A.; Lebedeva, L. V.; Tuchkevich, V. M.;  
Chelnokov, V. Ye.; Shuman, V. B.; Yakivchik, N. I.

ORG: none

TITLE: Method of creating a source of diffusion of aluminum in silicon. Class 21,  
No. 176989 [announced by the Physical Engineering Institute im. A.F. Ioffe, AN SSSR  
(Fiziko-tekhnicheskyy institut AN SSSR)]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 24, 1965, 45

TOPIC TAGS: aluminum, diffusion, aluminum diffusion, junction, pnp junction, npnpn  
junction, pnn junction, junction forming

ABSTRACT: This Author Certificate introduces a method of forming an aluminum source  
for the diffusion of aluminum in silicon in an oxidizing atmosphere such as air. To  
simplify the technique and accelerate the diffusion, aluminum in the form of  $Al(NO_3)_3$   
solution or of a mixture of aluminum-oxide powder with powder oxides of metals such  
as tungsten, titanium, or tantalum is deposited by any well-known method on the sur-  
face of silicon plates. In a variant of the above method, in order to obtain struc-  
tures of the types p-n-p or n-p-n-p-n, the surface of silicon plate is first coated with  
a boron or phosphorus compound and subjected to heat treatment. In a further variant  
of the first and second methods, in order to form semiconducting structures of such

Card 1/2

UDC: 539.121.72.002.2: 621.382

I 30991-66

ACC NR: AP6002888

types as p-n-n+, one of the sides of the silicon plate is coated with an alcoholic solution of aluminum, boron, and nickel compounds, and the other side is coated with a solution of orthophosphoric acid in alcohol, followed by a heat treatment. [ND]

SUB CODE: 20,09 SUBM DATE: 05Mar64/ ATD PRESS: 4199

Card 2/2 LC



L 28897-66 EWI(m)/ENP(t)/ETI IJP(c) JD/WB  
ACC NR: AP6014695 SOURCE CODE: UR/0105/66/000/005/0058/0061

AUTHOR: Dumanovich, A. N.; Yevseyev, Yu. A.; Tuchkevich, V. M.; Chelnokov, V. Ye.;  
Yakivchik, N. I.

ORG: none

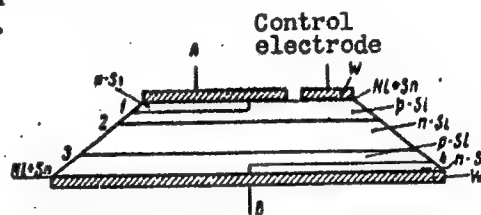
TITLE: VKDUS power silicon diffusion-type thyristors

SOURCE: Elektrichestvo, no. 5, 1966, 58-61

TOPIC TAGS: thyristor, power thyristor, semiconductor device/VKDUS thyristor

ABSTRACT: Some test results and nominal characteristics of Soviet-made VKDUS silicon diffusion-type power thyristors, developed in 1964, are reported. The thyristor (see figure) has a 5-layer n-p-n-p-n structure with outermost junctions shunted by metal contacts.

The junctions are prepared by successive diffusion of B, Al, P in a single-crystal (25-mm diameter, 0.35 mm thick) Si plate having a resistivity of 20-40 ohm-cm. Physical processes transpiring in the 5-layer structure are explained. Nominal peak voltages of VKDUS thyristors are 50-600 v. Nominal currents are 25-150 amp, depending on the type of cooling



Five-layer thyristor

UDC: 621.382.233

Card 1/2

L 28897-66

ACC NR: AP6014695

(natural, radiator, forced-draft, water). Forward voltage drop, 1.25--0.9 v.  
 Permissible overloads: 25% nominal current for 30 sec and 110% for 1 sec. Turn-on  
 time, 10 msec; recovery time, 25 msec or less. Operating frequency, up to 500 cps.  
 Ambient temperature -40 +110C; cooling-water temperature, 5--70C. Ambient humidity,  
 not over 98%; atmospheric pressure, 600--1500 torr. The thyristors are vibration-  
 and shock-proof; they are moisture- and corrosion-proof, but cannot operate in  
 chemically aggressive media. Orig. art. has: 7 figures and 3 tables. [03]

SUB CODE: 09 / SUBM DATE: 04Feb65 / ORIG REF: 004 / ATD PRESS: 5005

Card 2/2 CC

L 29954-66

ACC NR: AP6012478

SOURCE CODE: UR/0181/66/008/004/1159/1164

AUTHOR: Sikharulidze, G. A.; Tuchkevich, V. M.; Ukhanov, Yu. I.; Shmartsev, Yu. V.

ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-  
tekhnicheskii institut AN SSSR)

TITLE: Optical and magneto-optical phenomena in  $\text{CdSnAs}_2$

SOURCE: Fizika tverdogo tela, v. 8, no. 4, 1966, 1159-1164

TOPIC TAGS: optic activity, cadmium compound, tin compound, arsenic compound, Hall effect, electric conductivity, absorption spectrum, magnetooptic effect, light polarization, light scattering, phonon scattering

ABSTRACT: The authors investigated the absorption and reflection spectra, the optical activity, and the birefringence of infrared radiation in the wavelength range 3-20  $\mu$ . The  $\text{CdSnAs}_2$  crystals were obtained by directional crystallization and by zone growing with primer, from a melt synthesized in a quartz ampoule in an argon atmosphere. The Hall effect and the electric resistivity were measured in the temperature range 78-450K. Both n- and p-type crystals were measured. The reflection from samples with intrinsic conductivity (p-type,  $n = 6.25 \times 10^{18} \text{ cm}^{-3}$ ) was practically independent of the wavelength. Samples with other impurity densities (n-type,  $n = 2.6 \times 10^{18} \text{ cm}^{-3}$  and  $3.5 \times 10^{18} \text{ cm}^{-3}$ ) showed minima at  $\sim 14.4$  and  $12.5 \mu$ . At 130K, the reflection spectrum exhibited a minimum near  $13 \mu$  with and without a magnetic field. The absorption spectra showed a more complicated spectral dependence, wherein the short-wave

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L 29954-66

ACC NR: AP6012478

absorption depended little on the orientation of the plane of polarization, whereas the absorption spectrum in the region 0.16-0.30 eV changed appreciably with rotation of the plane of polarization. The measurements were made at 130 and 295K without and with a magnetic field (up to 25 kG). At 295K the width of the forbidden gap was  $0.25 \pm 0.01$  eV, the dielectric constant of the lattice was  $13.7 \pm 0.6$ . The Faraday effect was investigated in the wavelength range 4-11  $\mu$  at 130 and 295K, from which the mean value of the effective mass near the Fermi level was determined ( $0.042 \pm 0.005$ ) $m_0$ . The wavelength dependence of the absorption coefficient was of the power-law type with exponent  $-(2.50 \pm 0.07)$ , indicating that the predominant scattering mechanism at room temperature is scattering by optical phonons. The authors thank Yu. V. Mal'tsev for great help with the work. Orig. art. has: 4 figures, 4 formulas, and 2 tables.

SUB CODE: 20/ SUBM DATE: 04Sep65/ ORIG REF: 004/ OTH REF: 014

Card 2/2 (10)

L 9572-66 EWT(1)/ENT(m)/ENP(t)/ENP(b) IJP(c) JD  
 ACC NR: AP5027440 SOURCE CODE: UR/0181/65/007/011/3437/3439  
 AUTHOR: <sup>44, 55</sup> Mirzabayev, M.; <sup>44, 55</sup> Tuchkevich, V. M.; <sup>44, 55</sup> Shmartsev, Yu. V. <sup>49</sup>  
 ORG: <sup>44, 55</sup> Physicotechnical Institute im. A. F. Ioffe AN SSSR, Leningrad (Fiziko-tekhni-  
 cheskiy institut AN SSSR) <sup>B</sup>  
 TITLE: Piezomagnetoresistance in n-germanium  
 SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3437-3439 <sup>27</sup>  
 TOPIC TAGS: germanium, piezomagnetic effect, <sup>21, 44, 55</sup> magnetoresistance  
 ABSTRACT: Magnetoresistance is studied as a function of compressive mechanical stress up to  $8 \cdot 10^8$  dynes $\cdot$ cm $^{-2}$  in an antimony-doped specimen of germanium with an electron concentration of  $1.74 \cdot 10^{17}$  cm $^{-3}$ . Curves are given showing the effect of compressive mechanical stress on magnetoresistance and the effect of a magnetic field on piezoresistance. It was found that magnetoresistance increases with mechanical stress up to  $2.5 \cdot 10^8$  dynes $\cdot$ cm $^{-2}$  and becomes negative at higher stresses, approaching saturation as the magnetic field strength is increased. A transition to negative magnetoresistance takes place in the specimen at compressive stresses greater than  $5 \cdot 10^8$  dynes $\cdot$ cm $^{-2}$ . Orig. art. has: 2 figures, 2 formulas.  
 SUB CODE: 20/ SUBM DATE: 10Jun65/ ORIG REF: 001/ OTH REF: 005  
*leh*  
 Card 1/1

GREKHOV, I.V.; LINIYCHUK, I.A.; TUCHKEVICH, V.M.; CHELNOKOV, V.Ye.;  
SHUMAN, V.B.; YAKIVCHIK, N.I.

Some applications of regulated silicon power rectifiers.  
Elektrichestvo no.2:76-77 F '65. (MIRA 18:3)

I 3911-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD UR/0020/65/163/002/0338/0339  
 ACCESSION NR: AP5018743 29  
 B

AUTHOR: Mirzabayev, M.; Tuchkevich, V. M.; Shmartsev, Yu. V.

TITLE: Negative magnetoresistance in n-type silicon 27

SOURCE: AN SSSR. Doklady, v. 163, no. 2, 1965, 338-339

TOPIC TAGS: silicon, semiconductor carrier, magnetoresistance

ABSTRACT: In view of the scanty amount of published data on the subject, the authors measured the magnetoresistance of n-type silicon by a standard dc potentiometer method, in magnetic fields up to 16.5 kG. The measurements accurate to  $\pm 0.01\%$ , were made on samples of doubly-cruciform shape at temperatures 4.2 and 1.70K. Typical plots of the negative magnetoresistance against the electron density are shown in Fig. 1 of the enclosure. The higher values of magnetoresistance observed by H. Roth et al. (Phys. Rev. Lett. v. 11, 328, 1963) are attributed to the presence of uniaxial tension in their sample. This report was presented by V. P. Konstantinov. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Fiziko-tehnicheskii institut im. A. F. Ioffe AN SSSR (Physicotechnical Institute AN SSSR)

Card 1/3

L 3911-66

ACCESSION NR: AP5018743

SUBMITTED: 12Dec64

ENCL: 01

SUB CODE: 88

NR REF SOV: 000

OTHER: 002

Card 2/3



L 3911-66

ACCESSION NR: AP5018743

ENCLOSURE: 01

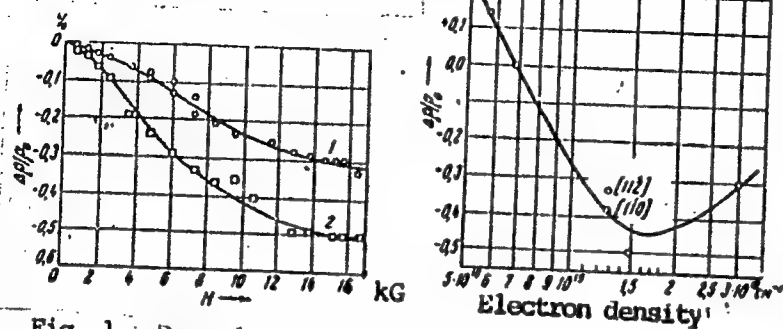


Fig. 1. Dependence of the negative magnetoresistance of n-type silicon on the magnetic field intensity (left) and on the carrier density (right).

Card 3/3

MIRZABAYEV, M.; TUCHKEVICH, V.M.; SHMARTSEV, Yu.V.

Piezoelectric resistance and magnetoresistance in n-germanium.  
Fiz. tver. tela ó no.12:3718-3721 D '64 (MIRA 18:2)

1. Fiziko-tekhnicheskiy institut imeni Ioffe AN SSSR, Leningrad.

MIRZABAYEV, M.; TUCHKEVICH, V.M.; SHMARTSEV, Yu.V.

Negative magnetic resistance in n-silicon. Dokl. AN SSSR 163 no.2:338-339 J1 '65. (MIRA 18:7)

1. Fiziko-tekhnicheskiy institut im. A.F.Ioffe AN SSSR. Submitted December 31, 1964.

TUGHKEVICH, V.M., doktor fiz.-matem.nauk

Semiconductor converters. Vest. AN SSSR 34 no.9:34-47 S 164.  
(MIRA 17:10)

L 52785-65 ENT(1)/ENT(m)/T/ENT(t)/ENT(b)/ENT(h) Pz-o/Peo IJP(c) JD/AT  
ACCESSION NO: AP5010742 UN/0181/65/007/004/1235/1236

**"APPROVED FOR RELEASE: 08/31/2001**

**CIA-RDP86-00513R001757330008-7**

**APPROVED FOR RELEASE: 08/31/2001**

**CIA-RDP86-00513R001757330008-7"**

TUCHKEVICH, V.V.; ROMANOV, V.A.; TOTUBALINA, M.G.

Study of neutron-deficient Lu isotopes using a prism  
spectrometer equipped with quadrupole lenses. Izv. AN SSSR.  
Ser.fiz. 27 no.2:246-248 F '63. (MIRA 16:2)

1. Fiziko-tekhnicheskii institut im. A.F.Ioffe AN SSSR.  
(Beta-ray spectrometer) (Lutetium-isotopes--Decay)

TUCHKEVICH, V.V.; ROMANOV, V.A.; IODKO, M.G.

Relative intensity of conversion electrons in  $\text{Lu}^{170}$  and  $\text{Lu}^{172}$ .  
Izv. AN SSSR Ser. fiz. 24 no.12:1457-1464 D '60. (MIRA 13:12)  
(Lutetium--Isotopes)



IODKO, M.G.; ROMANOV, V.A.; TUCHKEVICH, V.V.

Relative intensity of conversion electrons in  $\text{Lu}^{169}$  and  $\text{Lu}^{171}$ . Izv.  
AN SSSR Ser. fiz. 24 no.12:1465-1469 D '60. (MIRA 13:12)

1. Fiziko-tekhnicheskiy institut AN SSSR.  
(Lutetium—Isotopes)

TUCHKEVICH, V. V.

21(7)

ARTICLES:

Kol'man, V. M., Metalvarshchik, E. Ya., 301/56-57-8/62  
Frochmanovskiy, E. K., Rozanov, V. A., Tuchkevich, V. V.

TITLE:

The Multipolarities of  $\gamma$ -Transitions in  $^{169}$

PHYSIOLOGICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,  
Vol 37, No 3(9), pp 639-642 (RUSK)

ABSTRACT:

The  $\gamma$ -spectrum and the spectrum of the conversion electrons of excited  $Ta^{169}$ -nuclides has already been investigated by several authors. In the present paper the level scheme of the considerably deformed  $Ta^{169}$ -nucleus and its particular characteristics are first discussed (Fig. 1, Ref. 4). In the following, the authors give several results obtained by measurements of the ratios of  $\gamma$ -conversion coefficients to the  $L$ -subshell of  $Ta^{169}$  ( $K_{\gamma} = 65, 94, 110, 130.5, 177$ , and  $196$  kev). Further, the multipolarities of the transitions were determined and for mixed radiations the percentage of the components was determined. The intensities of the conversion lines were measured by means of  $\beta$ -spectrometers, as a source a thin  $Ta^{169}$ -layer on aluminum foil was used.

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The production of this source is described in detail: A tantalum target was irradiated with  $12.5$  MeV protons on the synchrocyclotron of the Ob'edinskoye Institute of Physics and Technology (Joint Institute of Nuclear Research, Dubna, USSR). The rare-earth elements produced were separated by ion exchange (using the cationite KU-2) and subjected to a process of preparation which is described. Finally, a  $L$ -fraction ( $Ta^{169}$ ) was obtained on the aluminum foil, which goes over into  $Ta^{169}$  with a half life of  $\sim 24$  days. Figure 2 shows the conversion lines of  $177$  kev  $\gamma$ -quanta onto the  $L$ -subshell of  $Ta^{169}$  and Figure 3 shows the same for  $196$  kev  $\gamma$ -quanta. In both cases also the  $L_{II}$  and  $L_{III}$ -maxima are distinctly marked beside the steep  $L_{\gamma}$ -peak. The results obtained by these investigations are shown in a table. Thus, the following was obtained for the  $177$  kev transition:  
 $L_{II}/L_{III} = 1 : (0.24 \pm 0.01) : (0.17 \pm 0.006) ; L_{II}/L_{\gamma} = 94\% M1 + 16\% E2, L_{III}/L_{\gamma} : \text{the same mixture.}$

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For the  $196$  kev transition the following is given:  
 $L_{II}/L_{III} = 1 : (0.13 \pm 0.002) : (0.053 \pm 0.001) ; L_{II}/L_{\gamma} = 91\% M1 + 7\% E2, L_{III}/L_{\gamma} : 90\% M1 + 10\% E2. There are 3 figures, 1 table and 15 references, 8 of which are Soviet.  
ASSOCIATION: Leningradskiy fiziko-tekhnicheskii institut Akademii Nauk SSSR (Leningrad Physico-technical Institute of the Academy of Sciences, USSR)  
SUBMITTED: April 9, 1959$

Card 3/3

KEL'MAN, V.M.; METSKHVARISHVILI, R.Ya.; PREOBRAZHENSKIY, B.K.;  
ROMANOV, V.A.; TUCHKEVICH, V.V.

Investigation of spectra of conversion electrons of neutron  
deficient lutetium isotopes. Zhur. eksp. i teor. fiz. 35 no.5:  
1309-1310 N '58. (MIRA 12:3)

1. Leningradskiy fiziko-tekhnicheskii institut AN SSSR.  
(Lutetium--Spectra)

**"APPROVED FOR RELEASE: 08/31/2001**

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**APPROVED FOR RELEASE: 08/31/2001**

**CIA-RDP86-00513R001757330008-7"**

S/048/60/024/012/003/011  
B019/B056

AUTHORS: Tuchkevich, V. V., Romanov, V. A., and Iodko, M. G.

TITLE: Relative Intensities of  $\text{Lu}^{170}$  and  $\text{Lu}^{172}$  Conversion Electrons

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,  
Vol. 24, No. 12, pp. 1457-1464

TEXT: The present paper was read at the 10th All-Union Conference on Nuclear Spectroscopy, which was held in Moscow from January 19 to January 27, 1960. The authors investigated the relative intensities of the conversion lines by means of a spectrometer with double focusing, a line half-width of from 0.25-0.35%, and a solid angle of 0.1-0.2%. Lutecium fraction, which had been separated from a Ta target irradiated with 660-Mev protons was used as a source. Table 1 shows the energies and the relative intensities of conversion lines in the  $\text{Yb}^{172}$  spectrum and the energies and relative intensities of the  $\gamma$ -lines, which had been taken from a paper by Dilman et al. (Ref. 2). On the basis of these data, the internal conversion coefficients for a number of transitions were calculated, and the multiplicities of these transitions could be estimated.

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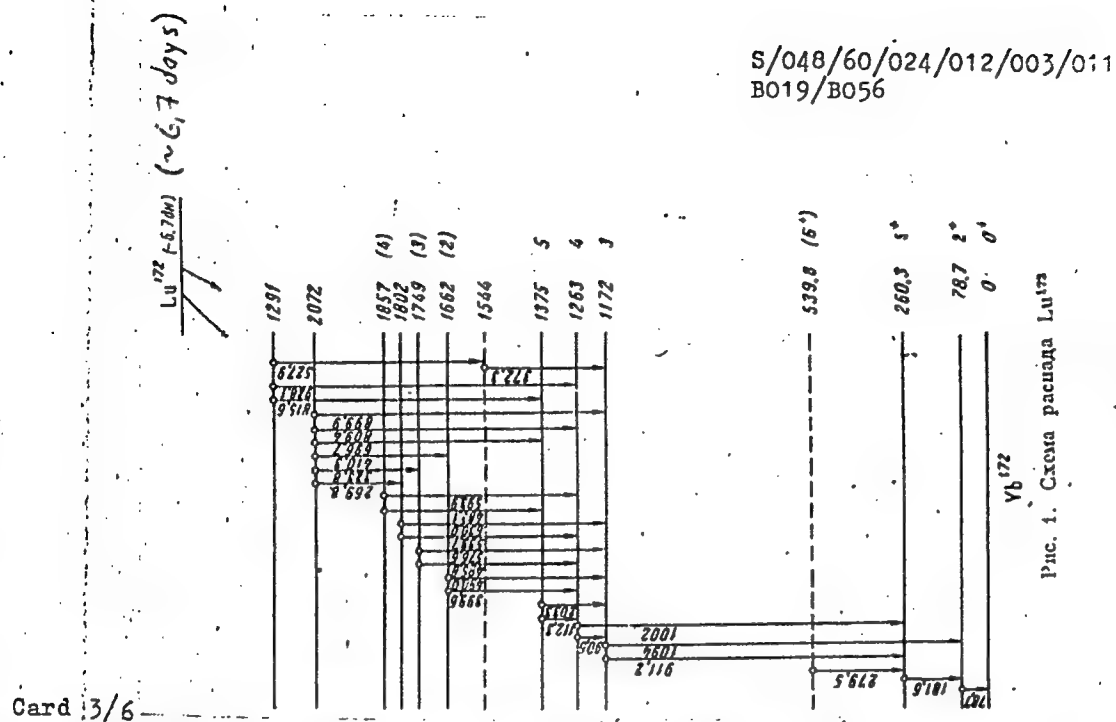
Relative Intensities of  $\text{Lu}^{170}$  and  $\text{Lu}^{172}$   
Conversion Electrons

S/048/60/024/012/003/011  
B019/B056

There follows a detailed discussion of these data, and a discussion of experimental results, which the authors consider to be in need of improvement. The investigations of the transition energies and the conversion electron intensities of  $\text{Yb}^{170}$ , yielded rather inexact results. Partly, the occurrence of a large number of weak lines with short half-lives in the conversion electron spectrum is to blame for this. Table 5 gives the transition energies and the intensities of the conversion lines of  $\text{Yb}^{170}$ , the doubtful data being shown in brackets. A possible variant of the decay scheme is shown in Fig. 2. There are 2 figures, 5 tables, and 12 references: 6 Soviet, 5 US, and 1 Danish. ✓

Text to Table 1: 1) Transition energy; 2), 3), and 4) Conversion line intensities; 5) Energy according to data by Dilman; 6) Intensities according to data by Dilman in units used by the authors; 7) Conversion coefficient; 8) Total intensity of conversion lines;  
Text to Table 5: 1) Transition energy; 2) and 3) Conversion line intensities; 4) Total intensity; 5) Multiplicity.

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B019/B056

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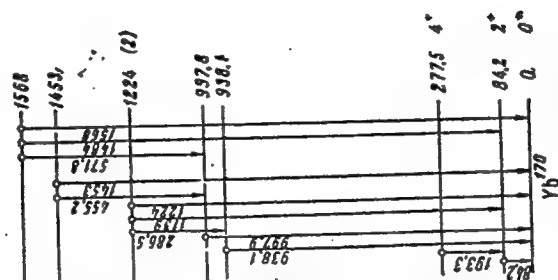


Рис. 2. Возможный вариант  
схемы распада  $\text{Lu}^{176}$

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1	2	3	4	5	6
E, keV	$I_K^*$	$I_L$	$I_M$	Среднее по [3], keV	Исходные данные, по [3] и по матрице, иначе
78,7	1300±100	2700±60	700±100	79±2	1557
90,6	500±30	600	140±10	—	750
112,3	—	100	25±5	113±3	806
181,6	195±5	100	24,5±0,5	181±5	528
203,3	36,5±0,8	11,1±0,3	5,8±0,3	203±5	—
269,8	13,3±0,4	2,3±0,2	<1,7	—	—
279,5	4,5	1,1	—	—	—
318,8	1,3	—	—	—	—
323,8	8,6±0,5	1,7±0,1	0,8	323	556
372,3	6,3±0,1	1,2	—	370±5	—
377,4	1,2	—	—	—	—
399,6	1,9±0,2	—	—	—	—
410,3	4,9±0,3	1,3	—	—	—
482,1	1,2±0,1	0,7	—	—	—
485,8	1,2±0,15	—	—	—	—
489,0	3,5±0,4	—	—	—	528
527,9	4,5±0,2	1,4±0,2	—	525±10	—
539,7	1,7	0,3	—	—	—
576,6	0,5	—	—	—	—
594,0	0,74	—	—	—	—
626,4	1,6±0,2	0,4	—	—	—
630,0	0,65	<0,58	—	—	—
696,7	3,6±0,3	0,8±0,1	0,38	—	258
809,4	6,2±0,2	1,2±0,1	0,47	820±7	—
815,6	0,71	—	—	—	722
899,9	10,1±0,2	1,5±0,2	0,36	900±5	—
911,2	3,0±0,1	0,54	0,2	—	—
928,1	1,2	—	—	—	—
986,3	0,4	<0,2	—	—	—
1002	0,9±0,2	<1,0	—	—	1446
1094	7,2±0,2	1,4±0,1	—	1090±10	—
1113	0,54	<0,40	—	—	—

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$\alpha_K$	$I_K^{**}$
0,81	7830
—	1550
0,24	~130
0,9(-2)	1100
—	310
—	~74
—	(560)
—	—
—	~380
—	30-220
—	100-230
8,5(-3)	(530)
—	60+360
—	20+130
—	~200
—	30+200
—	(280)
2,4(-2)	(720)
—	155-1960
—	—
1,4(-2)	62-760
—	590-6380
5,0(-3)	—

S/048/60/024/012/003/011  
B019/B056

Table 5

Энерг. переход, keV *	1	2	3	4	5	Энергия перехода, keV *	1	2	3	4	5
	$I_K^{**}$	$I_L$	Полная интенсивность	Мультиплетность			$I_K^{**}$	$I_L$	Полная интенсивность	Мультиплетность	
84,2	1400±200	7600	14300	E2	511,7	1,4	—	—	—	—	—
181,5	14,9	—	—	—	543,9	~7	—	—	—	—	—
193,3	100	59	760	E2	(560,9)	1,2	—	—	—	—	—
222,7	11±2	~3	—	—	571,8	2,4	—	—	—	—	—
279,4	—	~4	—	—	756,2	~0,3	—	—	—	—	—
282,9	8,5±0,3	1,8	—	—	837,1	~2,1	—	—	—	—	—
286,5	3,3±0,4	—	—	—	938,1	3,7±0,1	—	—	—	—	—
382,1	~3,5	<1,8	—	—	983,2	~5	—	—	—	—	—
(386,3)	1,4	—	—	—	997,9	~2	—	—	—	—	—
388,7	2,7	<1,3	—	—	(1103)	1,3±0,1	—	—	—	—	—
396,1	4,6	~2,3	—	—	1139	2,3±0,1	—	—	—	—	—
416,8)	1,5	—	—	—	1224	2,1±0,3	—	—	~1000	—	—
419,6)	—	~1,8	—	—	1281	2,0±0,1	—	—	~1000	—	—
455,2	~3	~1,2	—	—	1454	14,0±0,3	1,8	1500+18000	—	—	—
487,3	1,7	—	—	—	1484	8,4±0,2	1,5	1000+13000	—	—	—
					1568	1,8	—	200+3000	—	—	—

Card 6/6

S/048/60/024/012/004/011  
B019/B056

AUTHORS: Iodko, M. G., Romanov, V. A., Tuchkevich, V. V.  
TITLE: Relative Intensities of  $\text{Lu}^{169}$  and  $\text{Lu}^{171}$  Conversion Electrons  
PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,  
Vol. 24, No. 12, pp. 1465-1469

TEXT: The present paper was read at the 10th All-Union Conference on Nuclear Spectroscopy, which was held in Moscow from January 19 to January 27, 1960. The conversion electron spectra of  $\text{Lu}^{169}$  and  $\text{Lu}^{171}$  were investigated by means of a  $\beta$ -spectrometer with double focusing, the relative line width amounted to 0.25-0.35%. The two sources were obtained by irradiation of Ta targets with 660-Mev protons on the synchrocyclotron of the OIYaI (Joint Institute of Nuclear Research), the Lu fraction was separated by ion exchange and applied onto an Al foil. As the  $\text{Lu}^{169}$  and  $\text{Lu}^{170}$ -half-lives are nearly equal, the lines of these isotopes could not be separated. Table 1 shows the relative intensities of the conversion lines

Card 1/5

Relative Intensities of  $\text{Lu}^{169}$  and  $\text{Lu}^{171}$   
Conversion Electrons

S/048/60/024/012/004/011  
B019/B056

of  $\text{Lu}^{169}$ , Table 3 shows the  $\text{Yb}^{171}$  transition energies and relative intensities of the conversion electrons. The decay schemes already known are shown in Figs. 1 and 2. L. A. Sliv and I. M. Vand (Ref. 5) are mentioned. The authors thank V. M. Kel'man for his interest. B. S. Dzhelepov and L. K. Peker for valuable comments, as well as G. L. Vlasenko and V. P. Belov for their assistance in the measurements. There are 2 figures, 4 tables, and 8 references: 5 Soviet, 2 US, and 1 Danish. ✓

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology of the Academy of Sciences USSR)

Text to Table 1: 1) Energy of the transition line; 2), 3), and 4) are the relative intensities of the  $\text{Lu}^{169}$  conversion lines.

Text to Table 2: 1)  $\text{Yb}^{171}$  transition energies; 2), 3), and 4) relative intensities of the conversion electrons.

Card 2/5

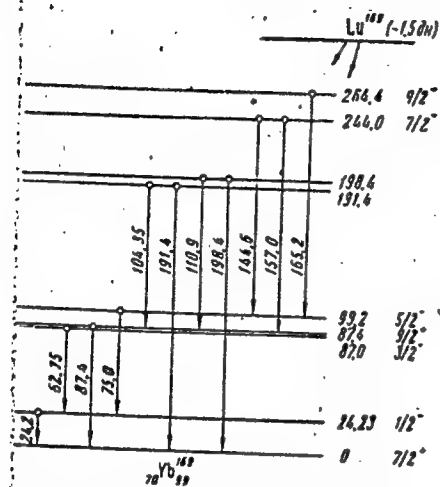


Рис. 1. Схема распада  $Lu^{169}$

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S/048/60/024/012/004/011  
B019/3056

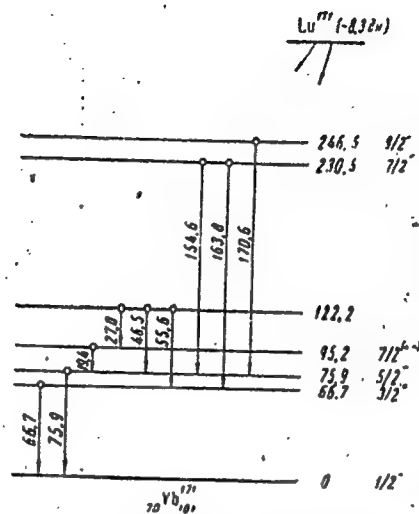


Рис. 2. Схема распада  $Lu^{171}$

S/048/60/024/012/004/011  
B019/B056

Таблица 1

Относительные интенсивности конверсионных линий  $\text{Lu}^{100}$

1	2	3	4	1	2	3	4	1	2	3	4
E, keV	K	L	M	E, keV		L		E, keV	K		M
24,2	—	9000	—	227,9	—	12	—	563	9	—	—
62,6	—	11300	—	243	—	22	9	590,8	—	4	—
87,3	18100	—	—	258	112	—	—	634,6	15	—	—
91,8	3800	—	—	290,9	100	20	7,4	640,9	3,5	—	—
110,9	—	1000	250	369,1	102	—	—	655,4	1,4	—	—
144,5	—	188	105	378,3	205	30	11	707,4	> 3,6	—	—
150,8	830	530	—	403,9	12	—	—	820,9	8	—	—
164,9	1100	790	130	458,5	57	9	—	879,3	0,7	—	—
166,5	130	—	—	470,4	—	6	—	960,6	55	8,7	—
191,5	1700	350	—	479,5	16	4	—	1061	28	—	—
198,6	200	—	—	491,7	—	9	—	1072	24	—	—
				548	17	3	—	1079,5	6,4	—	—

Card 4/5

S/048/60/024/012/004/011  
B019/B056

Энергии переходов  $\text{Yb}^{171}$  и относительные интенсивности конверсионных электронов

1	E, keV	2	K	3	L	4	M	E, keV	K	L	M
	55,83	—	5500	—				712,6	10	2,7	1,4
	68,8	—	14600	—				739,4	100	16	3
	72,38	—	3000	—				767,2	8,5	—	—
	75,97	2800	41000	8700				780,0	9	—	—
	85,55	3800	—	—				839,3	26	1,5	—
	91,28	1500	—	—				853,9	—	—	—
	498,4	5	—	—				986,0	2	—	—
	517,7	9	4	—				1020	2,5	—	—
	626,2	11	2	—				1029	1,	—	—
	666,8	29	5	3				1037	2,	—	—
	688,8	6,5	—	—				1042,9	2	—	—
								1102,8	—	—	—

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**CIA-RDP86-00513R001757330008-7**

**APPROVED FOR RELEASE: 08/31/2001**

**CIA-RDP86-00513R001757330008-7"**



TUCHKEVICH, V. V., ROMANOV, V. A., METSKHVARISHVILI, R. Ya., and KELMAN, V. M.  
Physical-Technical Institute, USSR AS, Leningrad

"Investigation of Conversion Lines in the  $\beta$ -Spectrum of  $\text{Ir}^{192}$ ,"  
Journal of Nuclear Physics, Amsterdam, No. 4, pp 240-247, 1957.

21(8)  
AUTHORS: Kel'man, V. M., Metakhvarishvili, R. Ya., Preobrazhenskiy, B.K.,  
Romanov, V. A., Tuckevich, V. V.

TITLE: The Investigation of the Spectrum of Conversion Electrons of  
the Isotopes of Lutetium With Neutron Deficit (Issledovaniye  
spektra konversionnykh elektronov neytronodefitsitnykh  
izotopov lyutetsiya)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,  
Vol 35, Nr 5, pp 1309-1310 (USSR)

ABSTRACT: The investigation of the radiation of greatly deformed nuclei  
furnishes material for the further development of the collective  
nuclear model. It is just from this point of view that the  
isotopes of lutetium are of interest. Recently several papers  
(Refs 1-4) have been published which deal with lutetium  
isotopes with neutron deficit, but the data given by these  
papers do not convey a clear idea of the decay of these iso-  
topes. Additional investigations are therefore necessary. The  
authors of the present paper investigated the conversion spec-  
trum of the isotopes of a lutetium fraction, which had been  
separated from a tantalum target irradiated with fast (660 MeV)  
protons. The method employed for separation has already been

Card 1/3

SOV/56-35-5-51/56

The Investigation of the Spectrum of Conversion Electrons of the Isotopes of Lutetium With Neutron Deficit

described (Ref 5). Measurements were carried out by means of a prism- $\beta$ -spectrometer and by means of a double-focusing spectrometer. The spectrum of the conversion electrons consists of many lines, which belong to Lu<sup>169</sup> (half-life  $\sim 1.5$  days), Lu<sup>170</sup> ( $\sim 2$  days), Lu<sup>171</sup> ( $\sim 8$  days), Lu<sup>172</sup> ( $\sim 6.7$  days), Lu<sup>173</sup> ( $\sim 200$  days). Belonging of lines to the various corresponding isotopes was determined from the half-life. A table gives the energies of  $\gamma$ -transitions the conversion lines of which decrease with the period  $\sim 1.5$  to 2 days. The second table contains the energies of the  $\gamma$ -transitions with the period 6.7 to 8 days. The energy of these transitions was determined from the energy of K- and L-conversion lines. There are 2 tables and 6 references, 4 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskoy institut Akademii nauk SSSR (Leningrad Physico-Technical Institute of the Academy of Sciences, USSR)

Card 2/3

83708

S/056/60/038/004/001/048  
B019/B070

24.6720

AUTHORS:

Romanov, V. A., Iodko, M. G., Tuchkevich, V. V.

TITLE:

Long-lived Lutecium Isotopes /9

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
Vol. 38, No. 4, pp. 1019-1026

TEXT: The authors have studied the conversion spectra of  $\text{Lu}^{173}$ - and  $\text{Lu}^{174}$  isotopes. The measurements were made with a spectrometer with double focusing. Two different sources were used. Source I was separated from a Ta target 10-12 hours after it had been exposed to 660 Mev protons for a quarter of an hour; source II was separated from a Ta target which was exposed for about three months. Source II was used previously by B. S. Dzhelepov and others (Refs. 1,2). Most of the conversion lines found belong to  $\text{Lu}^{173}$  whose relative intensities and energies (Table 1) are well known. The values obtained here agree with those of Yu. G. Bobrov and others (Ref. 1). The relative intensities of  $\gamma$ -rays measured by G. M. Gorodinskiy and others (Ref. 3) and collected in Table 2 are then

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Long-lived Lutecium Isotopes

83708

S/056/60/036/004/001/048  
B019/B070

discussed. The level scheme of  $\text{Yb}^{173}$  (Fig. 2) is discussed with the help of the well known level scheme of  $\text{Lu}^{173}$ . A number of lines were found in the long-lived spectra of Lu isotopes which do not belong to  $\text{Lu}^{173}$ . The energy values of these lines are given in Table 3, and their identifications are discussed in detail. The authors are convinced that they could belong only to  $\text{Lu}^{174}$ . A possible variant of the decay scheme is discussed with the help of Fig. 3. The spins of the excited levels are discussed on the assumption that the ground state of  $71\text{Lu}_{103}^{174}$  has either the spin  $6^-$  or  $1^-$ . The half life of  $\text{Lu}^{174}$  is  $165 \pm 5$  days. The lines found here are attributed to the M1 and M3 transitions ( $E_\gamma = 44.7$  kev, and  $E_\gamma = 59.0$  kev, respectively) of the isomeric states of  $\text{Lu}^{174}$ . The half life of the isomeric state is given to be 90 days. The authors thank Professor V. M. Kel'man for his interest in the work and valuable advice. L.A. Sliv and I. M. Band (Ref. 4) are mentioned. There are 3 figures, 4 tables, and 13 references: 6 Soviet, 6 US, and 1 Dutch.

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Long-lived Lutecium Isotopes

83708

S/056/60/C38/004/001/048  
B019/B070

ASSOCIATION: Leningradskiy fiziko-tekhnicheskii institut Akademii nauk  
SSSR (Leningrad Institute of Physics and Technology of the  
Academy of Sciences, USSR)

SUBMITTED: August 7, 1959

X

Card 3/3

83709

S/C56/60/032/004/C02/042  
BG19/BO70

24.6720  
AUTHORS:

Iodko, M. G., Tuckovich, V. V., Romanov, V. A., Krosin, O. M.

TITLE:

An Investigation of the Relative Intensities of Some  
Conversion Lines in the Spectrum of Neutron-deficient  
Lu-Isotopes <sup>M</sup>

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
Vol. 38, No. 4, pp. 1027-1030

TEXT: The authors have investigated the strong lines of the conversion spectrum of the neutron deficient Lu-isotopes by means of a prism spectrometer. The two sources used here were obtained by separating the Lu-isotope fraction from a Ta-target which had been irradiated by 660-Mev protons. With the first source, the energies and the intensities of the conversion lines 66.70 and 75.85 kev in the Lu<sup>171</sup> spectrum were measured, and 78.70 and 90.55 kev lines in the spectrum of Lu<sup>172</sup>. The relative intensities of the 84.19-kev L-lines in the Lu<sup>170</sup>-spectrum, the 87.30-kev L-lines in the Lu<sup>169</sup>-spectrum, and the 181.4 kev L-lines in the Lu<sup>172</sup>-  
Card 1/3

83709

An Investigation of the Relative Intensities of Some Conversion Lines in the Spectrum of Neutron-deficient Lu-Isotopes S/056/60/038/004/002/043 B019/B070

spectrum were measured with the second source. As the second source was very thick, the data obtained with it are to be considered only as rough values. The energies of the lines were measured by a method developed earlier by Romanov (Ref. 4). The energies of the conversion lines, and the calculated values of the transition energies are given in Table 1. The conversion lines are represented graphically in Fig. 1. The ratios of the L-conversion lines of the transitions with 66.74 and 75.89 kev in the Lu<sup>171</sup>-spectrum are given in Table 2. The analogous ratios for 78.74 kev-, 90.66 kev-, and 181.4 kev in the Lu<sup>172</sup>-spectrum are given in Table 3. The theoretical and the experimental values are compared in the tables 2 and 3, and the multiplicities of  $\beta$ -transitions are derived from the corresponding L-sub-shell intensities. L. A. Sliv and I. M. Band (Ref.10) are mentioned. There are 1 figure, 3 tables, and 16 references: 6 Soviet, 8 US, and 2 Dutch.

Card 2/3



83709

An Investigation of the Relative Intensities of Some Conversion Lines in the Spectrum of Neutron-deficient Lu-Isotopes S/056/60;038/004/002/048 E019/EC7C

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Physics and Technology of the Academy of Sciences, USSR)

SUBMITTED: August 7, 1959

Card 3/3

TUCHKEVICH, V.V.

AUTHORS: Kel'man, V.M., Metskhvarishvili, R.Ya., Romanov, V.A. 56-3-6/59  
Tuchkevich, V.V.,

TITLE: The Investigation of Conversion Lines in the  $\beta$ -Spectrum of  $\text{Ir}^{192}$ .  
(Issledovaniye konversionnykh liniy v  $\beta$ -spektre  $\text{Ir}^{192}$ )

PERIODICAL: Zhurnal Eksperim. i Teoret.Fiziki, 1957, Vol. 33, Nr 3, pp.588-594  
(USSR)

ABSTRACT: With the help of a prism- $\beta$ -spectrometer (resolving of 0,04 %) the  
conversion coefficients and the multipole order of the following  
 $\gamma$ - lines were determined:

$E_\gamma$ in KeV	K/L	K/M	multipole order
136,3			$(80 \pm 1)\% \text{ E2} + (20 \pm 1)\% \text{ M1}$
201,3	$1,85 \pm 0,04$		$(86 \pm 2)\% \text{ E2} + (14 \pm 2)\% \text{ M1}$
205,8	$1,83 \pm 0,04$		E2
295,8	$2,35 \pm 0,04$	$8,9 \pm 0,2$	E2
308,5	$2,38 \pm 0,02$	$9,5 \pm 0,2$	$(97 \pm 2)\% \text{ E2} + (3 \pm 2)\% \text{ M1}$
316,5	$2,22 \pm 0,02$	$9,3 \pm 0,2$	E2
468,0	$3,0 \pm 0,1$	$10,2 \pm 0,2$	E2
604,5	$4,7 \pm 0,1$		$(88 \pm 2)\% \text{ E2} + (12 \pm 2)\% \text{ M1}$

Card 1/2

The Investigation of Conversion Lines in the  $\beta$ - Spectrum of  $\text{Ir}^{192}$  56-3-6/59

There are 2 tables, 3 figures, and 5 Slavic references.

ASSOCIATION: Leningrad Physical-Technical Institute AN USSR  
(Leningradskiy fiziko-tehnicheskoy institut Akademii nauk SSSR)

SUBMITTED: March 18, 1957

AVAILABLE: Library of Congress

Card 2/2

ZHILINA, Ye.A.; MODZOVISHVILI, T.I.; TUCHKIN, G.M.; DIKKER, G.L., spetsred.;  
MURASHOVA, O.I., red.; SOKOLOVA, I.A., tekhn. red.

[From the experience of the "Iava" tobacco factory] Iz opyta  
tabachnoi fabriki "Iava." Moskva, Pishhepromizdat, 1957. 41 p.  
(Moscow--Tobacco industry) (MIRA 11:9)

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Tuchkin G. M., "Automatic Regulation of Air Conditioning Processes,"  
Tabak / Tabacco7, 1953, No 1, Pages 23-27.

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Tuchkin G. M., Upolotnyayushchiye kryshki reguliruyushchikh klapanov kotlov  
vysokogo davleniya / Packing Covers for Regulating Valves in High-Pressure  
Boilers, Elektricheskiye stantsii, 1953, No 5, Page 48, 2 figures.

TUCHKIN, G. M.

Factories - Air Conditioning

Automatic regulation of air-conditioning processes. Tabak 14 No. 1, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953. Unclassified.

KELLEYEV, A. M.; IASHKOV, V. S.: TUGHTEV, G. B.

Air Conditioning

Planning apparatuses for air-conditioning. Tabak, 13, no. 4, 1962.

Monthly List of Russian Accessions, Library of Congress, October 1962. UNCLASSIFIED.



TUCHKIN, G. M.

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Air-conditioning apparatus. Tabak, 13, No. 4, 1952.

Montly List of Russian Accessions, Library of Congress October 1952 UNCLASSIFIED

TUCHKOV, B.; ZDANOVICH, A.

Technical machine service centers abroad. Vnesh.torg. 43  
no.2:32-33 '63. (MIRA 16:2)  
(Machinery industry)

TUCHKOV, B.

Indian farmers on a Soviet tractor. Vnesh. torg. 43 no.8:34-35  
'63. (MIRA 16:8)

(India--Tractors)

TUCHKOV, B. E.

HYDRODYNAMICS

"Principles in the method of calculation of single-stage hydro-transformers." V. I. Lapidus.  
Reviewed by B. E. Tuchkov. Avt. trakt. prom. No. 8, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1952 ~~1953~~, Uncl.

TUCHKOV, B. Ye.

Lapidus, V. I.

"Principles in the method of calculation of single-stage hydro-transformers." V. I. Lapidus.  
Reviewed by B. Ye. Tuchkov, AVt. trakt. prom., No. 8, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1952 ~~1953~~, Uncl.

SOV-11-58-10-7/12

AUTHOR: Tsuchkov, I.I.

TITLE: Carnian Deposits in the North-East Part of the USSR and Their Lower Limit (Otlozheniya Karniyskogo yarusa severo-vostoka SSSR i ikh nizhnaya granitsa)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geologicheskaya, Nr 10, 1958, pp 87 - 101 (USSR)

ABSTRACT: The author describes the Carnian deposits in main cross-sections of different regions of the north-east part of the USSR. He divides these deposits into two levels, upper and lower, according to the fossilized fauna peculiar to each level, and compares this fauna with fossils found in Carnian deposits of North America, the Alps and Indonesia. He proposes, as a result of this comparison, to include the lowest part of the Carnian level containing different species of the Nathorstites, into the Ladinian stage. The following scientists who worked in those regions are mentioned: P. Wittenburg, E. Toll, A. Bunge, P. A. Kazanskiy, M.V. Bayarunas, L.D. Kiparisova, S.V.

Card 1/2

Carnian Deposits in the North-East Part of the USSR and Their Lower Limit. SOV-11-58-10-7/12

Obruchev, A.A. Nikolayev, Yu.N. Popov. There is 1 map, 1 table and 17 references, 5 of which are Soviet, 6 German, 4 English and 2 American.

SUBMITTED: December 10, 1956

ASSOCIATION: Ministerstvo Geologii i okhrany nedr SSSR, 4-ye geologicheskoye upravleniye, Moskva (Ministry of Geology and Conservation of Mineral Resources, 4th Geological Administration, Moscow)

1. Geology--USSR 2. Paleogeology--Analysis 3. Geological time--Determination

Card 2/2

TUCHKOV, I.I.

Recent data on the stratigraphy of upper Triassic and Jurassic deposits in the western shore area of the Sea of Okhotsk (Toron-Tugur region). Dokl. AN SSSR 134 no.3:658-661 S '60. (MIRA 13:9)

1. Predstavleno akad. N.S. Shatskim.  
(Tugur Bay region—Geology, Stratigraphic)



TUCHKOV, I.I.

New diagram of the Mesozoic stratigraphy of the lower  
Amur Valley. Izv.vys.ucheb.zav.; geol.i razv. no.3:  
3-22 My '60. (MIRA 13:7)

1. Ministerstvo geologii i okhrany nedr SSSR.  
(Amur Valley--Geology, Stratigraphic)

TUCHOLKA-SZMEJA, BARBARA

POLAND/Analytical Chemistry. Analysis of Inorganic Substances.

E-2

Abs Jour: Ref. Zhur-Khimiya, 1958, No II, 35890.

Author : Barbara Tucholka-Szmeja.

Inst : Not given.

Title : Spectrographic Determination of Strontium in Minerals.

Orig Pub: Chem. Analit., 1956, I, No 4, 255-262.

Abstract: Spectra are stimulated in acetylene-air flame with the application of the Zeiss burner and atomizer (model III) and registered on the spectrograph Q-24. It is established, that the intensity of the line Sr 4067.3 A diminishes in presence of Mg and Ca. Therefore, Ca and Mg are preliminary separated from Sr. The content of Sr is approximately established before the analysis by way of stimulation of the spectrum in the alternating current arc at the evaporation from the socket of

Card : 1/2

TUCHKOV, I.I.

~~Tentative correlation of Aldan coal seams based on the results of~~  
spectroscopic analysis [with summary in English]. Sov. geol. 1  
no.3:120-123 Mr '58. (MIRA 11:5)

1. 4-ye geologicheskoye upravleniye.  
(Aldan Basin—Coal—Geology)

FLORENSOV, N.A.; TRESKOV, A.A.; SOLOMENKO, V.P.; TICHKOV, I.I.

Discussions. Geol. i geofiz. no.4:101-104 '81 (NIRA 18:2)